

REMARKS

The Office Action has withdrawn Claims 1-66 from consideration. In addition, the Office Action has allowed Claims 85-88. However, it has objected to the disclosure for allegedly containing some informalities. Further, the Office Action has objected to Claims 70, 73, 78, 79 and 87, alleging that they contain informalities. Moreover, Claim 89 has been rejected under 35 U.S.C. §112, second paragraph, for allegedly failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Claims 67 and 90-96 are rejected under 35 U.S.C. §102(e), as defining subject matter which is allegedly anticipated by the teachings in U.S. Patent No. 6,471,936 to Chen et al. ("Chen et al. I"). Further Claims 90-96 are rejected under 35 U.S. C. §102(e), as defining subject mater which is allegedly anticipated by the teachings in Chen et al. ("Chen et al. II"). In addition, Claim 68 is rejected under 35 U.S.C. §102(e) as defining subject matter which is allegedly anticipated by the teachings in U.S. Patent No. 6,409,567 to Amey Jr. et al. ("Amey Jr. et al."). Finally, Claims 90-96 are rejected under 35 U.S.C. §102(b) as defining subject matter which is allegedly anticipated by the teachings in an article by Kiang et al. in J. Phys. Chem., 1994, 6612-6618 ("Kiang et al.").

Applicants have amended the specification and claims, which when considered with the comments hereinbelow, are deemed to place the present case in condition for allowance. Favorable action is respectfully requested.

Applicants have amended the specification in accordance with the suggestions on Page 3 of the Office Action. Consequently, the objects to the specification is overcome; withdrawal thereof is respectfully requested.

Applicants have also amended Claims 70, 73, 78, 79 and 87 per the suggestion on Pages 2 and 3 of the Office Action. Such amendments overcome the objections to Claims 70, 73, 78, 79 and 87. Withdrawal thereof is respectfully requested.

Applicants have also amended other claims. Claims 66, 71, 72, 75, 76, 80, 82 and 85 have been amended to correct grammatical errors. Claim 68 has been amended to recite that there are essentially two layers of carbon atoms, i.e., the electron emissive material is comprised substantially of double walled nanotubes, as described on Page 22, line 18 to Page 24, line 6 of the instant specification. Claims 90, et seq., have been amended to recite that the fullerene material is predominantly comprised of double walled nanotubes. Support is found throughout the specification, see, for example, Page 8, lines 18-26; Page 14, line 4 to Page 16, line 1 of the instant specification.

No new matter has been added to the application.

The amendments to Claim 89 clarified the subject matter therein. However, such amendment does not narrow the scope thereof. Regardless, the amendment to Claim 89 overcomes the rejection thereof under 35 U.S.C. §112, second paragraph. Withdrawal hereof is respectfully requested.

In support of the rejection of Claim 67 and 90-96 the Office Action cites Chen et al. I.

Claim 67 is directed to, inter alia, a solid substance comprised of more than one half by weight of hollow carbon nanotubes having walls consisting essentially of two layers of carbon atoms. Claims 90-96 are directed to products by process wherein the product is fullerene comprised substantially of double walled nanotubes.

Chen, et al. I discloses various types of carbon nanotubes, single walled nanotubes and multi-walled nanotubes. However, Chen, et al. I does not teach, disclose or suggest double walled nanotubes. A review of Chen et al. I, clearly establishes that there is no mention therein of double walled nanotubes.

The Office Action refers to column 4, lines 25-35 and Figures 1b, 1d, 2b and 2d of Chen et al. I. However, the passage in Column 4 does not teach, disclose or suggest double walled nanotubes. Moreover, neither Figures 1b, 2b, 1d nor 2d depict double walled nanotubes. Figures 1b and 2b depict nanotubes having several layers; not just two layers, as would be the case if double walled nanotubes were formed. Moreover, Figures 1d and 2d depict stacked truncated nanocones, but these are also multilayered. Unlike the present invention, Chen et al. I does not teach or disclose nanotubes wherein the number of carbon layers are controlled, so that the product formed thereby contain substantially double walled nanotubes. As recognized by the United States Patent and Trademark Office, the conditions of the formation of the nanotubes in Chen et al. I is quite different that from the present invention. As a result, Chen , et al. does not produce DWNT's.

Anticipation requires that the cited reference have identity of invention with the claimed subject matter. Since Chen et al. I does not teach or disclose products wherein the product is comprised essentially or substantially of double walled nanotubes, Chen et al. I does not anticipate the subject matter of Claims 67 and 90-96. This rejection is thus obviated. Withdrawal thereof is respectfully requested.

In support of the rejection of Claims 90-96, the Office Action cites Chen et al. II, referring to the passage in Column 3, line 24-36 thereof. The Office Action alleges that the Chen et al. II product is a double walled nanotube and is produced by the method of Claim 1.

However, applicants disagree. There are differences in the process of the present invention and process disclosed in Chen et al. II. For example, the catalyst used in the present process is comprised essentially of a transition metal of the iron group of the periodic table and sulfur. That is, the catalyst contains sulfur. On the other hand, the catalyst used in the Chen et al. II does not contain sulfur. The differences in the process parameters result in a different product being formed. Moreover, there is no teaching therein of a fullerene product comprised substantially of double walled nanotubes. A review of Chen et al. II clearly establishes that there is no mention therein of double walled nanotubes. Further, there is no evidence of any fullerene product produced in Chen et al., II which is predominantly comprised of double walled nanotubes, as claimed.

Thus, Chen et al. II do not teach,, disclose or suggest fullerenes predominantly comprised of double walled nanotubes. Therefore, the rejection of Claims 90-96 under 35 U.S.C. §102(e) is obviated; withdrawal thereof is respectfully requested.

Pursuant to the rejection of Claim 68 under 35 U.S.C. §102(e), the Office Action cites Amey Jr. et al.

Claim 68 is directed to an electron-emissive material comprising a surface of emissive tubules wherein each of the plurality of emissive tubules is generally nanotubes with controlled number of graphene layers consisting essentially of two layers of carbon atoms.

Amey Jr. et al. do not teach, disclose or suggest an electron emissive material comprised of emissive tubules wherein the plurality of emissive tubules is generally nanotubes consisting essentially of two layers of carbon atoms.

The Office Action refers to Column 10, lines 20-32 of Amey Jr., et al. But, there is nothing in the passage which indicates that the nanotubes consist essentially of two

layers of carbon atom, as claimed. A review of the reference clearly establishes that there is no mention therein of any double walled nanotubes. The passage indicates that the layer of composite described therein is comprised of carbon nanotubes and glass, the latter material being one which is not comprised of carbon. Thus, the teachings therein is of a composite comprised of two different materials, one of which is not a nanotube. Therefore, the composite of Amey Jr. et al. is not generally nanotubes, as claimed, because it also contains glass. Thus, there is no teaching therein of emissive tubules therein which is generally nanotubes with controlled number of graphene layers consisting essentially of two layers of carbon atoms, as claimed. Thus, Amey Jr. et al. does not anticipate the subject matter of Claim 68. Therefore, the rejection of Claim 68 under 35 U.S.C. §102(e) is obviated; withdrawal thereof is respectfully requested.

Pursuant to the rejection of Claims 90-96 under 35 U.S.C. §102(b), the Office Action cites Kiang et al.

The Office Action refers to Figure 4(b) of Kiang et al. on page 6615. According to the text, Figure 4(b) refers to double layer nanotubes among single layer nanotubes. However, as clearly shown by the figure, the product is not predominantly comprised of double walled nanotubes, in contrast to the claimed subject matter of Claims 90-96. Even the reference so admits. Reference is made to page 6615 wherein it states:

The tube in Figure 4b is an example of a nanotube with a double layer wall found in the soot away from the electrodes (even though almost all of the tubes in this material had single-layer walls).

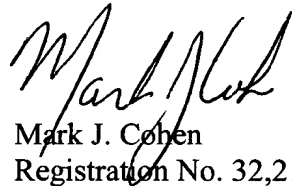
(Emphasis Added) In other words, the material in Figure 4b is comprised predominantly of single walled nanotubes; the double layer nanotube is one out of a large number of single

walled nanotubes in the soot. Thus, Kiang et al. do not teach, disclose or suggest a fullerene material comprised predominantly of double walled nanotubes, as claimed. Consequently, Kiang et al. do not anticipate the subject matter of Claims 90-96. Therefore, this rejection under 35 U.S.C. §102(b) is obviated; withdrawal thereof is respectfully requested.

Applicants have reviewed the other references cited, but not applied, in the Office Action, but they are deemed not to be pertinent to the present invention.

Thus, in view of the Amendments to the specification and the claims and the Remarks herein, it is respectfully subjected that the present case is in condition for allowance; which action is earnestly solicited.

Respectfully submitted,



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